

Author: A Nieman

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A Nieman*

1 Introduction

If cash is king, cryptocurrencies may be the next closest thing and we, South African lawyers, are largely clueless (as with too much of the Internet of Everything¹ unfortunately). Aspiring to absolution from this collective cluelessness begins with knowing that we know not and with cultivating a better understanding of the business of binary. In doing so, we may position and empower ourselves to become better ICT² lawyers.

Recently, courtesy of the Commonwealth Secretariat, I was collaborating with a few bitcoin enthusiasts in assessing the South African state of the nation apropos virtual currencies ("VCs"). Representatives of 10 Commonwealth member states met in London, the United Kingdom, on 17 and 18 February 2015. The roundtable was attended by officials from 10 countries and a number of partner organisations with an interest in the field of VCs. The representatives agreed, *inter alia*, to conduct a survey on VCs, aimed at collecting information which may assist in developing appropriate legislative and regulatory responses to VCs. The VC survey was initiated in Singapore, India, Tonga, Ghana, New Zealand, Kenya, Nigeria, Barbados, Uganda, Jamaica and South Africa.³

* Annamart Nieman. BIur; LLB; LLD (North-West University). Practising Advocate, Johannesburg Society of Advocates, Sandton. Part-time lecturer, Department of Auditing, University of Pretoria. Email: nieman@law.co.za or annamart.nieman@up.ac.za. I am indebted to Bretton Vine, of the Future Foundation, for his invaluable input in respect of the underlying technicalities, prevalence and calculations of the South African VC exchange transactional volumes.

¹ Or also referred to as the Internet of Things ("IoT"). Simply put this is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). The IoT is a giant network of connected "things" (including people-people, people-things and things-things), rendering anything that can be connected connected. Morgan 2014 <http://goo.gl/kIP9I7>.

² Information and Communications Technology.

³ Email correspondence with Mr Alex Bangwar, the then coordinator assigned to the VC project by the Rule of Law Division of the Commonwealth Secretariat. This role has now been assumed by Mr Dave Tait of the same division.

South Africa is thus also on the VC map, for better or for worse, given the pros and cons of VCs.

As, firstly, an African – in the eye of the beholder – who is stirred by *ubuntu*,⁴ and, secondly, as an alumnus of the North-West University committed to contribute my bit⁵ to the centenary edition of the Potchefstroom Electronic Journal ("PER"), I am spending this year's 67+ minutes on Nelson Mandela International Day⁶ to write up a few South African cents' worth of bitcoins on Bitcoin. Augmenting current awareness of VCs, particularly Bitcoin, is indeed doing something positive for the South African legal community. The potential growth and development opportunities associated with VCs are immense (and for all we know, we may have another Shuttleworth or Musk in our midst who will leverage these in the near future).

This article sets out to introduce the reader to VCs in general and decentralised convertible VCs ("DCVCs") in particular. Bitcoin is considered the leading type of DCVC in terms of value and volume.⁷ Since Bitcoin is becoming local, its early beginnings and prevalence in the South African marketplace are probed, adjacent to the South African regulatory response to VCs in general.

⁴ The value of *ubuntu* – a notion now coming to be generally articulated in South Africa – is "one shared value and ideal that runs like a golden thread across cultural lines," despite our country's history of deep divisions characterised by strife and conflict. "The need for *ubuntu*" in the preamble to the *Constitution of the Republic of South Africa* 200 of 1993 expresses "the ethos of an instinctive capacity for and enjoyment of love towards our fellow men and women; the joy and the fulfilment involved in recognising their innate humanity; the reciprocity this generates in interaction within the collective community; the richness of the creative emotions which it engenders and the moral energies which it releases both in the givers and the society which they serve and are served by." See *S v Makwanyane* 1995 3 SA 391 (CC) paras 263, 307.

⁵ Bit is short for **B**inary **D**igit. A bit represents the smallest unit of data and has a single binary digit, either a zero or a one. Eight bits typically add up to a byte and half a byte (four bits) add up to a nibble. Bitcoins consist of bits and, as such, cannot be seen like nickel, silver or gold coins, for example. This article is but a small contribution to what is a fairly complex, yet fascinating, topic.

⁶ Every year on 18 July (the day Nelson Mandela was born) the United Nations ("UN") joins a call by the Nelson Mandela Foundation to devote 67 minutes of time to helping others, as a way to mark Nelson Mandela International Day. In November 2009 the UN General Assembly declared 18 July "Nelson Mandela International Day" in recognition of the former South African President's contribution to the culture of peace and freedom. See *Resolution on Nelson Mandela International Day* GA Res 64/13, UN Doc A/RES/64/13 (2009).

⁷ SARB 2014 <https://goo.gl/2nX9Tv> 3.

2 Who's moving my cheese?⁸

2.1 VCs defined

VCs are many things to many people, possibly even unwittingly so. The concept of VCs is not a new one. To some extent, all currencies can be seen as virtual, given that for centuries now, currencies have been separated from the value of the goods that they represent.

The reason why VCs (and particularly Bitcoin) could be historically dramatic is clear from the colourful narrative of modern money. People initially swapped what they had for what they preferred, by bartering. However, when a person accepted what she or he did not want personally, because a third person who did have what this person wanted would accept it, the means of exchange became called money. Curiously and notoriously, virtually everything has been used as money, from sharks' teeth and cigarettes to stones and slaves.⁹

VCs, similarly, are a proxy for value, can take on a variety of forms and are seeing use across the payment landscape (including air miles, credit card points, retail loyalty or reward points, coupons, bitcoins, litecoins, altcoins, free applications ("apps") and content, game-based and in-app VC purchases). Even time and personal data, when bartered to receive something in return, can be seen as VCs. However, of the many applications of VCs, its use as a marketing and loyalty tool has been most prolific, helping to propel it into widespread use today. The VCs market is clearly multifaceted (and lucrative).¹⁰

⁸ Dr Spencer Johnson coined this phrase in his book *Who Moved My Cheese? An Amazing Way to Deal with Change in Your Work and in Your Life* (Johnson *Who Moved My Cheese?*). It's a story about change that takes place in a maze where four amusing characters look for "cheese" (cheese being a metaphor for what we want to have in life). Since money makes the world go round, going by the lyrics of the like named jazz song written by Allan Barnes and Robert Kelly, cheese in the current context denotes currency.

⁹ Louw *Business Day* 11.

¹⁰ McKee 2013 <http://goo.gl/5nsFFz> 2.

The definition of VC provided for the purposes of the Commonwealth Secretariat's VC Survey accords with the definition used by the Financial Action Task Force ("FATF")¹¹ in its *Virtual Currencies Key Definitions and Potential AML/CFT Risks Report*,¹² published in June 2014. Both these definitions are almost identical to the definition used by the National Payment System ("NPS") Department of the South African Reserve Bank ("SARB") in its *Position Paper on Virtual Currencies*¹³ issued on 3 December 2014:

A virtual currency (VC) is a digital representation of value that can be digitally traded and functions as a medium of exchange, a unit of account and/or a store of value, but does not have legal tender status.¹⁴

The SARB manifestly ascribes to the FATF's aim to aid discussion between FATF members by proposing vocabulary to provide a common language for developing conceptual tools which could assist in understanding how VCs operate and the risks and potential benefits they offer.¹⁵ In keeping with the FATF classification, the SARB further classifies VCs as either centralised or decentralised, and convertible and non-convertible:

- (a) All non-convertible VCs are centralised to a particular virtual community and cannot be exchanged for real currency (examples include: Q Coins; World of Warcraft Gold;¹⁶ and Project Entropia Dollars).¹⁷

¹¹ The FATF is an inter-governmental body established in 1989 by the Ministers of its current 34 Member jurisdictions, of which South Africa is one. The objectives of the FATF are to set standards and promote the effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system. The FATF is therefore a policy-making body which works to generate the necessary political will to bring about national legislative and regulatory reforms in these areas. See FATF 2015 <http://www.fatf-gafi.org/pages/aboutus>.

¹² FATF 2014 <http://goo.gl/G1PmdI> 4.

¹³ SARB 2014 <https://goo.gl/2nX9Tv>.

¹⁴ FATF 2014 <http://goo.gl/G1PmdI> 2.

¹⁵ FATF 2014 <http://goo.gl/G1PmdI> 3.

¹⁶ It is interesting to note that there seems to be an anomaly with the FATF referring to World of Warcraft Gold ("WoW gold") as both a centralised non-convertible and convertible VC. WoW gold is to be considered a centralised non-convertible VC and to the extent that it becomes convertible, possibly in an underground market, it is against the terms and conditions of the game.

¹⁷ FATF 2014 <http://goo.gl/G1PmdI> 4-5; SARB 2014 <https://goo.gl/2nX9Tv> 2.

(b) Convertible VCs have an equivalent value in real currency and can be exchanged back and forth for a real currency. Convertible VCs may be either centralised or decentralised:

[i] Centralised convertible VCs have a single third-party administering authority, who functions as a neutral entity between the principals in a transaction, and who controls the system. This administrator issues the currency, establishes the rules for its use, maintains a central payment ledger and has authority to redeem the currency. Examples of centralised VCs include Second Life Linden dollars; WebMoney ("WM Units"); and PerfectMoney.¹⁸

[ii] DCVCs are distributed, open-source, math-based peer-to-peer VCs that have no central administering authority, and no central monitoring oversight. Examples of DCVCs include Bitcoin; Litecoin and Ripple. DCVCs are considered cryptocurrency, i.e. a math-based DCVC that is protected by cryptography.¹⁹

The SARB, for the purposes of its position paper, further clarifies that DCVCs, as a subset of VCs, refer:

... specifically to decentralised, crypto-currencies that interact with the real economy, i.e. is (*sic*) exchangeable for legal tender and may be used to purchase real world goods and services.²⁰

The South African National Treasury *User Alert: Monitoring of VCs*²¹ defines VC as follows:

A virtual currency is a unit of account that is digitally or electronically created and stored. Members of the virtual community agree to accept these units as a representation of value in the same way that currency is accepted. In contrast to traditional currencies, virtual currencies operate without the authority of central banks, and are therefore not regulated.

¹⁸ FATF 2014 <http://goo.gl/G1PmdI> 4-5; SARB 2014 <https://goo.gl/2nX9Tv> 2-3.

¹⁹ FATF 2014 <http://goo.gl/G1PmdI> 4-5; SARB 2014 <https://goo.gl/2nX9Tv> 2-3.

²⁰ SARB 2014 <https://goo.gl/2nX9Tv> 4.

²¹ <http://goo.gl/9il1Wa>.

However, neither the SARB nor the FATF consider electronic money (*e-money*) as part of the VCs ecosystem. The SARB refers to mobile money as a form of *e-money* and as such, this contribution will not focus on either, other than to distinguish them from DCVCs.²²

The FATF *Report on Virtual Currencies Key Definitions and Potential AML/CFT Risks*²³ directs that VCs are distinct from *e-money* as *e-money* is:

a digital representation of fiat currency used to electronically transfer value denominated in fiat currency.²⁴

E-money is therefore considered to be:

a digital transfer mechanism for fiat currency – i.e., it electronically transfers value that has legal tender status.²⁵

In its *Position Paper on Virtual Currencies*,²⁶ the NPS Department of the SARB cross-references its *Position Paper on Electronic Money*²⁷ issued in November 2009, and reiterates its definition of *e-money* as:

electronically stored monetary value issued on receipt of funds and represented by a claim on the issuer.²⁸

The SARB points out that *e-money*, in its various forms (such as "Internet banking, mobile payments, mobile banking and prepaid instruments"²⁹) is generally accepted as a means of payment by persons other than the issuer and is redeemable for physical cash or a deposit into a bank account on demand. The SARB further declares the issuance of *e-money* as the business of a bank as defined in the *Banks Act* 94 of 1990, and directs that there is therefore a clear distinction between DCVCs and *e-money*, as DCVCs are "tradable for cash, while *e-money* is redeemable for physical cash or a deposit into a bank account on demand."³⁰

²² SARB 2009 <https://goo.gl/YZdmgI> 2.

²³ FATF 2014 <http://goo.gl/G1PmdI>.

²⁴ FATF 2014 <http://goo.gl/G1PmdI> 4.

²⁵ FATF 2014 <http://goo.gl/G1PmdI> 4.

²⁶ SARB 2014 <https://goo.gl/2nX9Tv>.

²⁷ SARB 2009 <https://goo.gl/YZdmgI>.

²⁸ SARB 2014 <https://goo.gl/2nX9Tv> 5.

²⁹ SARB 2009 <https://goo.gl/YZdmgI> 2.

³⁰ SARB 2014 <https://goo.gl/2nX9Tv> 5. The SARB released three position papers on *e-money* in 1999, 2006 and 2009, and all three of these position papers limit *e-money* issuance and trading to banks.

The use of mobile money, considered by the SARB as a form of e-money, is legal within South Africa but its issuance and trading is limited to banks.³¹ No legal and regulatory framework has been established in South Africa to support mobile money.³²

In further narrowing the scope of this contribution to practicable parameters,³³ customer loyalty or reward programs are not probed. A client loyalty/reward program (such as South African eBucks³⁴ and already in 2011, more than 100 others)³⁵ can be defined as a programme where consumers accumulate free points or miles based on the purchases of goods or services from a supplier. The consumer can exchange these points or miles for a variety of commodities (including goods, services or a discount on a next purchase transaction) at a supplier. Loyalty or reward points can, however, typically not be redeemed for fiat currency.

³¹ SARB 2009 <https://goo.gl/YZdmgI> 2. See further Perlman *Mobile Financial Services* 487-490 for other examples of mobile financial services systems in South Africa. The Kenyan M-Pesa also has a Bitcoin incarnation, i.e. Bitpesa with a Bitcoin wallet ("Kipochi") which has been integrated into the M-pesa. Interestingly, M-Pesa as such has not taken off locally (see Alfreds 2014 <http://goo.gl/NDhKSm>). Vodacom South Africa and licensed bank Nedbank launched the local incarnation of the Kenyan M-Pesa mobile financial service system. Vodacom formed a new division called Vodacom Payment Services (Pty) Ltd to operate M-Pesa in South Africa. From recent media coverage, it seems that 72 000 customers have joined the service since the re-launch in July 2014 (see TeleGeography 2015 <https://goo.gl/QP68Mn>). This is in juxtaposition to the initial 100 000 customers by May 2011, after its first launch in August 2010 (see Wikipedia 2015 <http://goo.gl/SaBw3l>).

³² However, the legal and regulatory framework in support of mobile money has been analysed in a recent (2012) PhD thesis entitled the "*Legal and Regulatory Aspects of Mobile Financial Services*". (Perlman *Mobile Financial Services*). Since there are not yet any specific laws that focus specifically or directly on mobile financial services in the jurisdictions under review in this study (focusing on South Africa in its Chapter 12 (Perlman *Mobile Financial Services* 483)), the study uses extrapolation from the common law and existing laws and regulations that could have general or specific applicability to mobile financial services. The same approach may be prudent in respect of VCs.

³³ Given the editorial guidelines on the permitted length of a contribution.

³⁴ According to a press release R5billion (EUR 359m) has been awarded in eBucks over the past 15 years (see FNB 2015 <https://goo.gl/JBNj2a>). Curiously Bretton Vine, to whom I am indebted for his input in respect of the technicalities underscoring this article, used eBucks in 2014 to order two low-cost tablet devices, which he then loaded with bitcoins to give out during a presentation on VCs at the annual Internet Service Providers Association's ("ISPA's") event, *Week*. He basically used free loyalty points to purchase tablets (unheard of even just a few years ago) with which he replaced his bank and then became a bank. Also, he purchased (already several years ago) cans of spam (from Amazon) using eBucks at a local retailer and Amazon affiliate. At no cost to him, cans of spam crossed the Atlantic and arrived on his doorstep – highlighting the anomaly of not being allowed to buy spam with eBucks locally, but being able to import it from Amazon. For a description of ISPA, see the reference to ISPA in footnote 98 below.

³⁵ See IOL 2009 <http://goo.gl/rLV4p0>; also Brink 2015 *JEF* 145.

The SARB asserts that DCVCs, in particular, are on the radar of many financial regulators worldwide due to their design and interaction with the real economy and currency, and the fact that DCVCs tend to be traded between users with a high degree of anonymity. Crime follows currency and the emerging VC regulatory proposals are directed at managing the risks associated with DCVCs. The SARB therefore focuses its attention on DCVCs.³⁶ In keeping with the position of the SARB, this article focuses on DCVCs, specifically Bitcoin, which is considered the leading type of DCVC in terms of value and volume.³⁷

2.2 Enter Bitcoin

In 2009 a mysterious new technology – Bitcoin – emerged, seemingly out of nowhere, but actually as the result of two decades of intense research and development by a nearly anonymous researcher or researchers, called Satoshi Nakamoto. "Bitcoin in 2014" has been labelled as being as disruptive a technology as the Internet in 1993 and personal computers in 1975.³⁸

Bitcoin is a consensus network that enables an entirely novel payment system and a VC complete. It is a decentralised peer-to-peer payment network that is powered by its users with no central authority or middlemen. Bitcoin can be considered cash for the Internet. From an end-user perspective, Bitcoin is nothing more than a mobile app or computer programme that provides a personal Bitcoin wallet and allows a user to send and receive bitcoins.

Nobody owns the Bitcoin network, much as no one owns the technology behind email. Behind the scenes, the Bitcoin network shares a public ledger called the "block chain." This ledger contains every transaction ever processed, allowing a user's computer to verify the validity of each transaction. The authenticity of each transaction is protected by cryptography and digital signatures corresponding to the sending addresses, allowing all users to have full control over sending bitcoins from their own Bitcoin addresses.

³⁶ SARB 2014 <https://goo.gl/2nX9Tv> 3.

³⁷ SARB 2014 <https://goo.gl/2nX9Tv> 3.

³⁸ Andreessen 2014 <http://goo.gl/GrbuH3a>.

In addition, anyone can process transactions using the computing power of specialised hardware and earn a reward in bitcoins for this service. This is called Bitcoin mining. Mining is the process of spending competitive computing power to process transactions, secure the network, and keep everyone in the system synchronized.. It can be perceived as being the Bitcoin data center, except that it has been designed to be fully decentralised with miners operating in all countries and no individual having control over the network.³⁹ As with mining all finite resources, the stream of bitcoins will eventually run dry, as only 21 million bitcoins will be generated at an exponentially decreasing rate over 20 years. Like mining in the physical world, the last dregs of precious metal will be the most difficult and expensive to mine.⁴⁰

A Bitcoin transaction typically includes the following entities: a Bitcoin sender who initiates the transaction over the Bitcoin network; a Bitcoin receiver who accepts the bitcoins; Bitcoin miners that act as transaction verifiers and processors by completing blocks; the core Bitcoin development team, which updates the Bitcoin codebase as necessary; and Bitcoin currency exchanges, which facilitate the conversion of bitcoins to other currencies and vice versa.⁴¹

The potential of Bitcoin is not solely limited to serving as a payment alternative – it has also been viewed as a commodity, asset class, or security ripe for speculative investment.⁴² Bitcoin is furthermore the most prominent triple entry bookkeeping system in existence.⁴³ It is seen by some⁴⁴ as a global, distributed, asset register or accounting ledger, which can account for the transfer of ownership between parties without the need for a trusted intermediary. This transfer can then be programmed to represent virtually anything: a share certificate, a title deed, an electronic Dollar or electronic Rand or a social grant token to buy food at a registered supermarket. Owning bitcoins gives a person access to this accounting ledger, which is a

³⁹ For a general discussion on the basics of bitcoins, see Bitcoin 2015 <https://bitcoin.org/en/faq>. The Canadian Senate hearing about Virtual Currencies (see Prisco 2014 <https://goo.gl/Zbaxi6>) and specifically the contribution by Andreas Antonopoulos (YouTube 2014 <https://goo.gl/erwSln>) provides insight into the bigger Bitcoin picture.

⁴⁰ Mitchell 2014 *Without Prejudice* 61.

⁴¹ Bryans 2014 *Indiana Law Journal* 447.

⁴² Tu and Meredith 2015 *Washington Law Review* 273.

⁴³ Bitcoin 2015 <https://bitcoin.org/en/faq>.

⁴⁴ Including Pieter Heyns and Carel van Wyk of BitX, the biggest VC exchange in South Africa.

highly liquid, global asset and which can be traded for any other currency. It therefore acts like a VC but it is much, much more.

Bitcoin initially stood as a novel idea of how financial transactions in the future would be conducted. However, by March 2013 it had proved itself to be a legitimate and viable form of currency⁴⁵ and the use of Bitcoin is ever growing. As commerce is becoming more globalised, currencies that are not tied to a sovereign are increasingly appealing. The growing adoption of Bitcoin on a global scale might indicate that the currency is here to stay.⁴⁶ As a result, governments cannot ignore it. The recent increase in regulatory developments for VCs suggests that governments understand this. These regulatory developments, curiously, may have the effect of possibly further driving market adoption of VCs by the legitimisation thereof.⁴⁷ Up to now, regulatory response from the South African regulators has been limited.

3 South African regulatory response to VCs

No primary or secondary legislation pertaining to VCs has been promulgated in South Africa.⁴⁸ No public consultation by which parliament and provincial legislatures consult with the people and interested or affected individuals, organisations and government entities before making a decision has taken place in respect of VCs in South Africa.⁴⁹

The potential applicability of all current legislation and regulations relevant to VCs in South Africa calls for in-depth research⁵⁰ and although the time is opportune, this article cannot begin to aspire to do so. A high-level overview of the regulatory ecosystem faced only by South African banks and financial institutions uncovers 53 acts that impact the financial sector specifically and an additional 149 acts that impact the business sector in general.⁵¹ This does not include self-regulatory and co-regulatory oversight over the financial and banking sectors, but includes legislation with indirect impact.

⁴⁵ Small 2015 *Hous J Int'l L* 587.

⁴⁶ Kien-Meng Ly 2014 *Harv J L & Tech* 608.

⁴⁷ Kien-Meng Ly 2014 *Harv J L & Tech* 608.

⁴⁸ As far as could be ascertained.

⁴⁹ As far as could be ascertained.

⁵⁰ Akin to what Perlman did in his thesis vis-à-vis mobile money (see Perlman *Mobile Financial Services*).

⁵¹ Lawack-Davids 2011 *Obiter* 712-730.

However, the *National Payment Systems Act* 78 of 1998 ("NPSA") gives the SARB the power to issue Directives, Position Papers, Circulars and Guidances. A contravention of a SARB Directive is an offence in terms of section 12 of the NPSA. The SARB publishes Position Papers in order to state its position in respect of specific payment system issues. These documents normally contain approaches, procedures and policy matters, which are applicable at a particular time.⁵² Although a Position Paper does not have the same legal binding power as a Directive, it is usually followed because of the persuasiveness of its having been issued by the SARB.⁵³ Also, if the SARB is so inclined it may issue a Special Directive aligned with the Position Paper and may seek a High Court order requiring compliance.⁵⁴

The absence of legal and regulatory frameworks in respect of VCs in South Africa is confirmed by various references in the SARB's *Position Paper on Virtual Currencies*.⁵⁵ The SARB emphasizes that it does not oversee, supervise or regulate the VC landscape, systems or intermediaries for effectiveness, soundness, integrity or robustness. Consequently, any and all activities related to the acquisition, trading or use of VCs (particularly DCVCs) are performed at the end-user's sole and independent risk, and end-users will have no recourse to the SARB.⁵⁶ The SARB highlights certain risks due to what it refers to as the generally unregulated nature of VCs and the many legal uncertainties regarding VC schemes⁵⁷

- (a) The lack of a proper regulatory and legal framework substantially exacerbates especially risks associated with the enforcement of the principle of finality and irrevocability in the payment systems.⁵⁸
- (b) No specific regulatory protection exists that would compensate the owner or user of VCs for any loss that may be suffered, should the VC fail or the business ceases to exist. Users need to be warned that they might lose their money.⁵⁹

⁵² SARB 2015 <https://goo.gl/wqrBmD>.

⁵³ Lawack-Davids 2012 *SA Merc LJ* 84.

⁵⁴ Lawack-Davids 2012 *SA Merc LJ* 84.

⁵⁵ SARB 2014 <https://goo.gl/2nX9Tv>.

⁵⁶ FATF 2014 <http://goo.gl/G1PmdI> 12.

⁵⁷ FATF 2014 <http://goo.gl/G1PmdI> 9.

⁵⁸ FATF 2014 <http://goo.gl/G1PmdI> 6.

⁵⁹ FATF 2014 <http://goo.gl/G1PmdI> 6.

- (c) Reputational risks and losses could also arise where VCs are offered to existing customers and unregulated VCs will conflate with regulated products by association.⁶⁰
- (d) Compared to conventional currencies, VCs are less susceptible to freezing or seizure actions by law enforcement agencies. The identification of relevant laws applicable to the contravention and the consequent gathering of evidence regarding a transaction can furthermore become an unattainable task.⁶¹
- (e) VC wallets and exchange operators have no obligation to provide disclosures to consumers related to service fees or charges associated with VC transactions, the volatility and unregulated nature of the VC ecosystem, or any of the other associated risks.⁶²
- (f) The transfer of VCs in and out of RSA is not supported by exchange regulations and requests to trade in VCs cross-border can therefore not be authorised by the SARB. If any such trades do take place, the risks associated with such trades are for the participants in such trades.⁶³

The SARB concludes that given the current landscape and information available, VCs pose no significant risk to financial stability, price stability or the NPS. However individuals or businesses that accept VCs and businesses involved in the VCs ecosystem are cautioned that any activities performed or undertaken with VCs are at their sole and independent risk.⁶⁴ The SARB reiterates its position that regulation should follow innovation but that it continues monitoring developments in this regard and reserves the right to change its position should the landscape warrant regulatory intervention.⁶⁵

⁶⁰ FATF 2014 <http://goo.gl/G1PmdI> 6.

⁶¹ FATF 2014 <http://goo.gl/G1PmdI> 9.

⁶² FATF 2014 <http://goo.gl/G1PmdI> 10.

⁶³ FATF 2014 <http://goo.gl/G1PmdI> 11.

⁶⁴ FATF 2014 <http://goo.gl/G1PmdI> 12-13.

⁶⁵ FATF 2014 <http://goo.gl/G1PmdI> 13.

The absence of legal and regulatory frameworks in respect of VCs in South Africa is further confirmed by various references in the *User Alert: Monitoring of Virtual Currencies*⁶⁶ issued by the South African National Treasury, and endorsed by the SARB, the Financial Services Board ("FSB"), the South African Revenue Service ("SARS") and the Financial Intelligence Centre ("FIC") on 18 September 2014. The user alert similarly warns that there are no specific laws or regulations that address the use of VCs and that, consequently, no legal protection or recourse is afforded to users of VCs. Due to their unregulated status, VCs cannot be classified as legal tender as any merchant may refuse them as a payment instrument without being in breach of the law.⁶⁷ VCs can also not be regarded as a means of payment as they are not issued on receipt of funds. The use of VCs therefore depends on the other participant's willingness to accept them. While VCs can be bought and sold on various platforms, they are not defined as securities in terms of the *Financial Markets Act*.⁶⁸ The regulatory standards that apply to the trading of securities therefore also do not apply to virtual currencies.⁶⁹

Moreover, the National Treasury emphasises that VCs also operate without the authority of central banks, in contrast to traditional currencies, and are therefore not regulated.⁷⁰ Because virtual currencies are not regulated, users are not protected and are accordingly at the risk of losing money.⁷¹ It also warns users that they deal in VCs at their own risk and with no recourse to South African authorities.⁷² An invitation is issued, however, to email questions, comments and any concerns in respect of investment proposals through VCs to the treasury.⁷³ The associated email address⁷⁴ returns an invalid recipient server error, which I suppose, in some way, affirms the warning about a lack of recourse.

The SARB, South African National Treasury, FSB, SARS and FIC have made it abundantly clear that, for now, the public is on its own as far as VCs are concerned. The primary public policy

⁶⁶ SALS 2013 <http://goo.gl/YtG3ql>.

⁶⁷ SALS 2013 <http://goo.gl/YtG3ql>.

⁶⁸ *Financial Markets Act* 19 of 2012.

⁶⁹ National Treasury 2014 <http://goo.gl/9il1Wa> 2.

⁷⁰ SALS 2013 <http://goo.gl/YtG3ql> 2.

⁷¹ National Treasury 2014 <http://goo.gl/9il1Wa> 3.

⁷² National Treasury 2014 <http://goo.gl/9il1Wa> 4.

⁷³ National Treasury 2014 <http://goo.gl/9il1Wa> 4.

⁷⁴ Financial.Policy@treasury.gov.za

objectives that impact the regulation of VCs include providing consumer protection, preventing money laundering, maintaining the safety and soundness of the financial system and preventing tax evasion.⁷⁵ However, no legal or regulatory frameworks have been developed specifically for VCs in South Africa as yet.

4 The beginnings of Bitcoin – a South African snapshot⁷⁶

Despite the absence of a South African regulatory response, there is no denying that the South African public is probing Bitcoin.

Generally, Bitcoin has been and is very visible in South Africa, although with an apparent regional bias towards Cape Town. South Africa, for example, held its first commercial Bitcoin conference in April 2015 in Cape Town.⁷⁷ Local innovator Lorien Gamaroff of Bankymoon,⁷⁸ a local blockchain smart metering solution provider for prepaid electricity and energy management, was one of the keynote speakers. Bithub, a VC hub and incubator, has just been launched by the Cape Innovation and Technology Initiative ("CiTi").⁷⁹ Regular Bitcoin meetups have been taking place in Cape Town and Stellenbosch since November 2013.⁸⁰ Regular Bitcoin meetups have also been taking place in Johannesburg since November 2014.⁸¹ Widespread, general coverage of Bitcoin has been prevalent in the media, especially with big price movements making the news. One of the more established publishers in the VC space, Cointelegraph,⁸² also has a local outfit.⁸³

⁷⁵ Bryans 2014 *Indiana Law Journal* 447.

⁷⁵ Gatto and Broeker 2014-2015 *Ohio St Entrepren Bus. LJ* 430.

⁷⁶ In computing terms, a snapshot is the state of a system at a specific point in time (and is analogous to a snapshot in photography).

⁷⁷ See Bitcoin 2015 <http://bitcoinconference.co.za>.

⁷⁸ See Prisco 2015 <https://goo.gl/xMeVDu>.

⁷⁹ See CiTi 2015 <http://goo.gl/NjXMij>.

⁸⁰ See De la Rouviere 2013 <http://goo.gl/hMAKzM>; Van Wyk 2013 <http://stellenboschbitcoin.splashthat.com/>.

⁸¹ Louw 2014 <http://goo.gl/wUfKOW>.

⁸² Cointelegraph 2015 <http://cointelegraph.com>.

⁸³ Cointelegraph South Africa 2015 <http://cointelegraph.co.za>.

In addition to the users of Bitcoin, the ecosystem supporting Bitcoin has been growing exponentially.⁸⁴ The three main categories of such supportive systems are firstly, the merchants who accept bitcoins as payment for goods and services; secondly, the Bitcoin mining community; and thirdly, Bitcoin exchanges. The presence and prevalence of these supportive systems within South Africa are probed below.⁸⁵

4.1 Merchants

Bitcoin has been widely adopted by merchants within South Africa as a mode of payment. This is evidenced by the fact that Payfast,⁸⁶ a prominent South African payment platform, has integrated Bitcoin into the checkout processes of over 30 000 of its clients (i.e. online merchants using its platform). South Africa's largest online retailer merchant Takealot⁸⁷ also accepts bitcoins⁸⁸ via this integration with Payfast.

There are furthermore various listings of South African Bitcoin and bitcoin-accepting merchants *inter alia* on Coinmap (42 listings),⁸⁹ Whotakescoin (12 listings),⁹⁰ Bitcoinzar (47 listings),⁹¹ and Ventureburn (10 listings).⁹² BitX also lists places to spend bitcoins in South Africa (22 listings).⁹³

However, only one example of immovable property⁹⁴ listed for sale in bitcoins⁹⁵ and one example of a South African citizen currently trying to sell movable property⁹⁶ for bitcoins could be located.⁹⁷

⁸⁴ Grinberg 2012 *Hastings Sci & Tech LJ* 165.

⁸⁵ Kien-Meng Ly 2014 *Harv J L & Tech* 591.

⁸⁶ PayFast 2015 <https://payfast.co.za>.

⁸⁷ Takealot 2015 <https://takealot.com>.

⁸⁸ And eBucks.

⁸⁹ Coinmap 2015 <http://coinmap.org>.

⁹⁰ Whotakescoin 2015 <http://goo.gl/LGtQoN>.

⁹¹ Bitcoinzar 2015 <http://goo.gl/giHOZu>.

⁹² Coetzee 2014 <http://goo.gl/5uSJXm>.

⁹³ BitX 2015 <https://bitx.co/spend>.

⁹⁴ A vacant South African plot.

⁹⁵ Unfortunately the advert expired and google doesn't have a cached version (the dead link was Gumtree Date Unknown <http://goo.gl/WyghaI> accessed on 10 June 2015). However, the link was posted to Reddit, and that link remains live at Reddit Date Unknown <http://goo.gl/Yw3nSv>.

⁹⁶ His/her car, at Anon Date Unknown <http://bitcoinformybluepolo.com>.

⁹⁷ Neither of the Bitpremier (Bitpremier 2015 <https://www.bitpremier.com>) and Cryptothrift (Cryptothrift 2015 <https://cryptothrift.com>) websites returns any results for South Africa. It is worth noting that

It is furthermore possible to purchase overseas goods or services online using bitcoins (via Payfast or with bespoke commerce plugins) and then have such goods or services delivered remotely to residents within South Africa. Overstock,⁹⁸ for example, accepts purchases paid for with bitcoins from South Africa.⁹⁹ Interestingly, the Dell¹⁰⁰ international website accepts purchases paid for with bitcoins, but does not accept international orders.¹⁰¹ The local Dell website¹⁰² does not yet accept any form of online sales and puts clients in touch with local resellers.

It is similarly possible to purchase goods or services online from local *e*-retailers using cash or loyalty and reward points (such as *e*Bucks) or DCVCs (such as Bitcoin) and have such goods or services delivered remotely to residents within South Africa. Certain security and identity checks must be satisfied to access these goods or services. Postal deliveries typically require identification on collection (and often customs duties payment, if purchased from abroad), whereas courier deliveries typically require a home address and identification on delivery.

4.2 Miners

The entire spectrum of Bitcoin miners is represented within South Africa, from miners using gimmicky universal serial bus ("USB") devices, to Bitcoin application-specific integrated circuit ("ASICs"),¹⁰³ to cloud mining. South Africa also has a manufacturer of

from within South Africa Bitpremier and Cryptothrift would not be considered ideal places to source goods from, since trusted local *e*-retailers and classifieds service the same niche market (and in some cases also act as Amazon resellers, accepting payment in bitcoins via Payfast, credit cards, electronic bank transfer or loyalty and reward points). Bitpremier and Cryptothrift therefore offer no specific added value compared to local *e*-retailers and classifieds.

⁹⁸ Overstock 2015 <http://overstock.com>.

⁹⁹ See Overstock 2015 <https://goo.gl/1L6p0c>.

¹⁰⁰ Dell 2015 <http://dell.com>.

¹⁰¹ According to a representative at its call centre spoken to on 18 June 2015.

¹⁰² Dell South Africa 2015 <http://dell.co.za>.

¹⁰³ A Bitcoin *ASIC* (of which the first was released on in 2013) is a microchip designed and manufactured specifically for Bitcoin mining. For the amount of power they consume, they are vastly faster than all previous technologies and already have made graphics processor unit ("GPU") mining, leave alone central processing unit ("CPU") mining, financially unwise in some countries and setups. See Bitcoin Wiki 2015 <https://goo.gl/sR1yJ9>.

mining equipment accessories, called OpenRigs,¹⁰⁴ which manufactures racks for mining clusters.¹⁰⁵

Miners typically choose a coin that is profitable and less difficult to mine. Due to the lower barrier to entry, miners operating in South Africa would typically mine altcoins (including common examples such as Litecoin, Monero and Primecoin) or any one or more of the large number of altcoins and cryptoassets available. There are, for example, currently 574 VCs and 57 cryptoassets listed on Coinmarketcap;¹⁰⁶ and 1358 cryptocurrencies listed on Crypto Database.¹⁰⁷ A miner proper in the cryptography context is a party who spends resources on hardware to produce, for example, bitcoins rather than buying bitcoins from someone else. However, many persons consider themselves miners also for investing in the myriad of third-party cloud mining services available on the Internet (such services ranging from the renting out of enthusiast equipment to others, to services offered by enterprise Bitcoin cloud mining companies).

The sheer volume of different DCVCs available renders it too challenging a feat for the purposes of this article to attempt quantifying mining activity in South Africa. It is, in fact, very difficult to substantiate or quantify any numbers on miners. It should also be noted that online resources¹⁰⁸ such as blockchain.info and dogechain.info typically do not contain geographic information.

South African Internet Service Providers ("ISPs") also explored hosting mining services. On the members' mailing list of the Internet Service Providers' Association ("ISPA"),¹⁰⁹ ISPs have discussed costing models for hosting Bitcoin.

¹⁰⁴ OpenRigs 2015 <https://openrigs.com>.

¹⁰⁵ The OpenRigs system is an easy-to-assemble, standalone, aluminium frame that is designed to liberally space 4, 6 or 8 GPUs, or other expansion cards on racks to be used in mining clusters, for example. These racks cause the immense computer processing heat to dissipate easily and naturally.

¹⁰⁶ Coinmarketcap 2015 <http://coinmarketcap.com>.

¹⁰⁷ Crypto Database 2015 <http://cryptodatabase.net/coins-all>.

¹⁰⁸ Such as Blockchain 2015 <https://blockchain.info/> and Dogecoin 2015 <https://dogechain.info/>, for example.

¹⁰⁹ ISPA 2015 <http://ispa.org.za>. ISPA is a South African Internet industry body not for gain. Established in 1996, it currently represents in excess of 170 ISPs with a diverse range of services and target markets. The Minister of Communications formally recognised ISPA as an industry representative body

4.3 Exchanges

No bank currently provides VC services in South Africa (other than loyalty or reward programmes, such as eBucks¹¹⁰ or nedbankgreenbacks,¹¹¹ and which are accepted by many merchants). However, infrastructure to support the interaction of VCs and fiat currencies exists within South Africa. This is evidenced *inter alia* by the active VC exchanges in South Africa, ie BitX,¹¹² Ice3x,¹¹³ altcointrader¹¹⁴ and Localbitcoins;¹¹⁵ the active VC services/applications in South Africa;¹¹⁶ and even a Bitcoin automated teller machine ("ATM") in Johannesburg, South Africa.¹¹⁷

VCS can be purchased in South Africa in cash, via credit card, and using electronic payment systems, as can be seen from the following examples:

- (a) BitX accepts electronic fund transfers ("EFTs") but not cash or credit cards.¹¹⁸ Payments are made only to bank accounts held in the name of verified users. Due to exchange controls, trading is limited to South African residents only.
- (b) Ice3x accepts EFTs but not cash or credit cards.¹¹⁹ Payments are similarly made only to the bank accounts of verified users.
- (c) Altcointrader unfortunately does not publish accepted payment types on its website.¹²⁰

in terms of section 71 of the Electronic and Communications Act 25/2002 during May 2009. Also see the reference to *Week* in footnote 34 above.

¹¹⁰ eBucks 2015 <https://www.eBucks.com>.

¹¹¹ Nedbank 2015 <https://nedbankgreenbacks.nedsecure.co.za>.

¹¹² BitX 2015 <https://bitx.co/market>.

¹¹³ Ice3x 2015 <https://ice3x.com>.

¹¹⁴ AltCoinTrader 2015 <https://www.altcointrader.co.za>.

¹¹⁵ LocalBitcoins 2015 <https://localbitcoins.com>.

¹¹⁶ Such as ZapGo 2015 <https://www.zapgo.co>.

¹¹⁷ Twitter 2015 <https://twitter.com/zabitcoinatm>.

¹¹⁸ See BitX 2015 <https://goo.gl/Ss9M2G>.

¹¹⁹ See Ice3x 2015 <https://goo.gl/bqRbVI>.

¹²⁰ AltCoinTrader 2015 <https://www.altcointrader.co.za>.

- (d) South African merchants using Localbitcoins accept one or more of cash, cash-by-mail, EFT, Society for Worldwide Interbank Financial Telecommunication ("SWIFT") transfer, moneygram, PerfectMoney, OKPay, Paypal, Western Union and Steam Gift Card.¹²¹

Although no banks with premises in South Africa offer financial services involving VCs, the BitX, Ice3x, Altcointrader and Localbitcoins exchanges do indeed offer such financial services. However, there are currently no commercial remittance or foreign exchange services active in South Africa using VCs. Manual remittance is possible and practical, where the party receiving bitcoins is able to sell it via several local exchanges, or via Localbitcoins. Charges vary from 1% on exchanges up to 6% for the Bitcoin ATM.

The transactional volumes generated by each of the South African VC exchanges are published as public feeds and are set out below. The calculations are based on downloadable files and/or manually-obtained figures located at third-party exchange graphing sites, such as CryptoCoin Charts:¹²²

- (a) BitX volumes: from 13 April 2013 to 4 June 2015, BitX traded R59,396,043.97 (EUR 4.2m) in fiat terms; or 13,686.00798 BTC in Bitcoin terms.¹²³
- (b) Ice3x Bitcoin volumes: from 15 May 2014 to 4 June 2015, Ice3x traded R1,166,137.16 (EUR 83k) in fiat terms; or 324.4743133 BTC in Bitcoin terms.¹²⁴
- (c) Ice3x Litecoin volumes: from 18 May 2014 to 4 June 2015, Ice3x traded R21,186.34 (EUR 1519) in fiat terms; or 258.662813 LTC in Litecoin terms.¹²⁵

¹²¹ See LocalBitcoins 2015 <https://goo.gl/mKOOvB>.

¹²² See CryptoCoin Charts 2015 <http://www.cryptocoincharts.info>.

¹²³ These figures can be verified at <https://bitx.co/data/trades.csv?pair=XBTZAR> or <http://api.bitcoincharts.com/v1/csv/bitxZAR.csv.gz>; alternatively, for a more graphic view, see the link at <https://cryptowat.ch/bitx/btczar/1week>.

¹²⁴ These figures have been calculated manually from CryptoCoin Charts 2015 <http://goo.gl/GdD8cG> (the figures were obtained by hovering the mouse over each day at the CryptoCoin Charts link and recording the volume and value for every single day up to 4 June 2015).

¹²⁵ These figures have also been calculated manually from CryptoCoin Charts 2015 <http://goo.gl/8u7bs9> (the figures were similarly obtained by hovering the mouse over each day at the CryptoCoin Charts link and recording the volume and value for every single day up to 4 June 2015).

- (d) Altcointrader volumes: no long-term historical data is available as the Altcointrader website reveals only the last 50 trades. As it is a relatively new exchange, without an application programming interface ("API")¹²⁶ access, it is not being tracked by any third-party exchange graphing and monitoring sites yet either.
- (e) Localbitcoins volumes: from 24 May 2013 to 04 June 2015, Localbitcoins for South Africa traded R45,009,374.38 (EUR 3.2m) in fiat terms; or 11135.51444 BTC in Bitcoin terms.¹²⁷

It is interesting to note that BitX, the biggest VC exchange in South Africa, initiated contact and registered with the FIC as an accountable institution, and as such aspires to comply with the *Financial Intelligence Centre Act*¹²⁸ ("FICA").¹²⁹

5 Conclusion

This article set out to augment current awareness of VCs in the South African legal community. To this end, it introduced the reader to VCs in general and DCVCs in particular.

Due to their design and interaction with the real economy and currency, DCVCs are on the radar of many financial regulators worldwide. Although regulation should follow innovation, awareness of the VC ecosystem will not only warrant appropriate regulatory intervention when the time comes, but will also enable the immense potential growth and development opportunities associated with VCs.

¹²⁶ In computer programming, an API is a set of routines, protocols, and tools for building software applications. It expresses a software component in terms of its operations, inputs, outputs, and underlying types. It also defines functionalities that are independent of their respective implementations, which allows definitions and implementations to vary without compromising the interface. A good API makes it easier to develop a programme by providing all the building blocks. A programmer then puts the blocks together. See Wikipedia 2015 <https://goo.gl/YrJjCf>.

¹²⁷ These figures can be verified at Bitcoin Charts 2015 <http://goo.gl/Ueh82j> or <http://api.bitcoincharts.com/v1/csv/localbtcZAR.csv.gz>.

¹²⁸ *Financial Intelligence Centre Act* 38 of 2001.

¹²⁹ As confirmed by Pieter Heyns, one of the co-founders of BitX.

As Bitcoin is considered the leading type of DCVC in terms of value and volume, this article probed its early beginnings in South Africa. Bitcoin is indeed becoming local and brings with it novel challenges and places pressure on established legal and regulatory frameworks that were not developed to respond to it. Certain challenges may potentially be managed within the existing South African legal and regulatory framework, while other unique legal and regulatory concerns may be incapable of such reconciliation.

South Africa has not promulgated any legislation pertaining to VCs and assessing the potential applicability of all current legislation and regulations relevant to VCs calls for in-depth research. The time is opportune and this article has aspired to serve as an appetiser to do so.¹³⁰

¹³⁰ And if you enroll as a researcher in alternative currencies at the University of Cumbria, in the United Kingdom, you can even pay your class fees in Bitcoin, although – as a feather in its cap – this university is currently the only university in the world accepting Bitcoin as payment. Vegter *Rapport* 22.

BIBLIOGRAPHY

Literature

Brink 2015 *JEF*

Brink S "An Evaluation of the Income Tax Treatment of Client Loyalty Programme Transactions by South African Suppliers" 2015 *JEF* 145-164

Bryans 2014 *Indiana Law Journal*

Bryans D "Bitcoin and Money Laundering: Mining for an Effective Solution" 2014 *Indiana Law Journal* 441-472.

Gatto and Broeker 2014-2015 *Ohio St Entrepren Bus LL*

Gatto J and Broeker ES "Bitcoin and Beyond: Current and Future Regulation of Virtual Currencies" 2014-2015 *Ohio St Entrepren Bus LL* 429-469.

Grinberg 2012 *Hastings Sci & Tech LJ*

Grinberg R "Bitcoin: An Innovative Alternative Digital Currency" 2012 *Hastings Sci & Tech LJ* 159-207

Johnson *Who Moved My Cheese?*

Johnson S *Who Moved My Cheese? An Amazing Way to Deal with Change in Your Work and in Your Life* (Putnam New York 1998)

Kien-Meng Ly 2014 *Harv J L & Tech*

Kien-Meng Ly M "Coining Bitcoin's 'Legal-bits': Examining the Regulatory Framework for Bitcoin and Virtual Currencies" 2014 *Harv J L & Tech* 587-608

Lawack-Davids 2011 *Obiter*

Lawack-Davids VA "Mind the Gap – Increasing Compliance – Burden and Regulatory Misalignment" 2011 *Obiter* 712-730

Lawack-Davids 2012 *SA Merc LJ*

Lawack-Davids VA "Analyses – The Legal and Regulatory Framework of Mobile Payments in South Africa: A Trade-off?" 2012 (2) *SA Merc LJ* 77-92

Louw *Business Day*

Louw L "The Bitcoin Revolution Could Change Government" *Business Day* (23 October 2013) 11

Mitchell 2014 *Without Prejudice*

Mitchell K "Bitcoin from the Beginning" March 2014 *Without Prejudice* 61-62

Perlman *Mobile Financial Services*

Perlman LJ *Legal and Regulatory Aspects of Mobile Financial Services* (LLD-thesis UNISA 2012)

Seforo 2014 *TaxTalk*

Seforo L "Currency and Forex Trading in the 21st Century: Bitcoin" 2014 *TaxTalk* 42-45

Small 2015 *Hous J Int'l L*

Small S "Bitcoin: The Napster of Currency" 2015 *Hous J Int'l L* 581-641

Tu and Meredith 2015 *Washington Law Review*

Tu V K and Meredith MW "Rethinking Virtual Currency Regulation in the Bitcoin Age" 2015 *Washington Law Review* 271 – 347

Vegter *Rapport*

Vegter I "Klatergoud? Geld Wat Stom Is" *Rapport* (30 March 2014) 22

Case law

S v Makwanyane 1995 3 SA 391 (CC)

Legislation

Banks Act 94 of 1990

Constitution of the Republic of South Africa 200 of 1993

Electronic and Communications Act 25 of 2002

Financial Intelligence Centre Act 38 of 2001

Financial Markets Act 19 of 2012

National Payment Systems Act 78 of 1998

International instruments

Resolution on Nelson Mandela International Day GA Res 64/13, UN Doc A/RES/64/13 (2009)

Internet sources

Alfreds 2014 <http://goo.gl/NDhKSm>

Alfreds D 2014 *Vodacom Re-launches M-pesa to Disrupt SA Banking*
<http://goo.gl/NDhKSm> accessed 8 June 2015

AltCoinTrader 2015 <https://www.altcointrader.co.za>

AltCoinTrader 2015 *Home Page* <https://www.altcointrader.co.za> accessed 29 June 2015

Andreessen 2014 <http://goo.gl/GrbuH3a>

Andreessen M 2014 *Why Bitcoin Matters* <http://goo.gl/GrbuH3a> accessed 29 June 2015

Anon Date Unknown <http://bitcoinformybluepolo.com>

Anon Date Unknown *South Africa's First Bitcoin Car Sale*
<http://bitcoinformybluepolo.com> accessed 10 June 2015

Bitcoin 2015 <http://bitcoinconference.co.za>

Bitcoin 2015 *Bitcoin Africa Conference: 16th & 17th April 2015, Cape Town, South Africa* <http://bitcoinconference.co.za> accessed 22 June 2015

Bitcoin 2015 <https://bitcoin.org/en/faq>

Bitcoin 2015 *FAQ* <https://bitcoin.org/en/faq> accessed 30 June 2015

Bitcoin Charts 2015 <http://goo.gl/Ueh82j>

Bitcoin Charts 2015 *Local Bitcoins (ZAR)* <http://goo.gl/Ueh82j> accessed 29 June 2015

Bitcoin Wiki 2015 <https://goo.gl/sR1yJ9>

Bitcoin Wiki 2015 *Mining* <https://goo.gl/sR1yJ9> accessed 29 June 2015

Bitcoinzar 2015 <http://goo.gl/giHOZu>

Bitcoinzar 2015 *Businesses that Accept Bitcoin in South Africa* <http://goo.gl/giHOZu> accessed 10 June 2015

Bitpremier 2015 <https://www.bitpremier.com>

Bitpremier 2015 *Luxury Listings* <https://www.bitpremier.com> accessed 29 June 2015

BitX 2015 <https://bitx.co/market>

BitX 2015 *Market* <https://bitx.co/market> accessed 29 June 2015

BitX 2015 <https://bitx.co/spend>

BitX 2015 *Spend Bitcoin* <https://bitx.co/spend> accessed 26 June 2015

BitX 2015 <https://goo.gl/Ss9M2G>

BitX 2015 *How Can I Fund My Account?* <https://goo.gl/Ss9M2G> accessed 8 June 2015

Blockchain 2015 <https://blockchain.info/>

Blockchain 2015 *Home Page* <https://blockchain.info/> accessed 29 June 2015

CiTi 2015 <http://goo.gl/NjXMij>

Cape Innovation and Technology Initiative 2015 *CiTi Launches First Digital Currency Hub and Incubator in South Africa* <http://goo.gl/NjXMij> accessed 8 June 2015

Coetzee 2014 <http://goo.gl/5uSJXm>

Coetzee J 2014 *Bitcoin Accepted Here: 6 SA Ecommerce Stores Using the Cryptocurrency and Why* <http://goo.gl/5uSJXm> accessed 10 June 2015

Coinmap 2015 <http://coinmap.org>

Coinmap 2015 *South Africa* <http://coinmap.org> accessed 29 June 2015

Coinmarketcap 2015 <http://coinmarketcap.com>

Coinmarketcap 2015 *Home Page* <http://coinmarketcap.com> accessed 29 June 2015

Cointelegraph 2015 <http://cointelegraph.com>

The Cointelegraph 2015 *Home Page* <http://cointelegraph.com> accessed on 29 June 2015

Cointelegraph South Africa 2015 <http://cointelegraph.co.za>

The Cointelegraph South Africa 2015 *Home Page* <http://cointelegraph.co.za> accessed 29 June 2015

Crypto Database 2015 <http://cryptodatabase.net/coins-all>

Crypto Database 2015 *Crypto Coin Information* <http://cryptodatabase.net/coins-all> accessed 29 June 2015

CryptoCoin Charts2015 <http://www.cryptocoincharts.info>

CryptoCoin Charts 2015 *Home Page* <http://www.cryptocoincharts.info> accessed 29 June 2015

CryptoCoin Charts 2015 <http://goo.gl/GdD8cG>

CryptoCoin Charts 2015 *BTC/ZAR* <http://goo.gl/GdD8cG> accessed 29 June 2015

CryptoCoin Charts 2015 <http://goo.gl/8u7bs9>

CryptoCoin Charts 2015 *LTC/ZAR* <http://goo.gl/8u7bs9> accessed 29 June 2015

Cryptothrift 2015 <https://cryptothrift.com>

Cryptothrift 2015 *Home Page* <https://cryptothrift.com> accessed 29 June 2015

De la Rouviere 2013 <http://goo.gl/hMAKzM>

De la Rouviere S 2013 *Stellenbosch Bitcoin Meetup* <http://goo.gl/hMAKzM>
accessed 16 June 2015

Dell 2015 <http://dell.com>

Dell 2015 *Home Page* <http://dell.com> accessed 29 June 2015

Dell South Africa 2015 <http://dell.co.za>

Dell South Africa 2015 *Home Page* <http://dell.co.za> accessed 29 June 2015

Dogecoin 2015 <https://dogechain.info/>

Dogecoin 2015 *Home Page* <https://dogechain.info/> accessed 29 June 2015

eBucks 2015 <https://www.eBucks.com>

eBucks 2015 *Home Page* <https://www.eBucks.com> accessed 29 June 2015

FATF 2014 <http://goo.gl/G1PmdI>

Financial Action Task Force 2014 *Virtual Currencies: Key Definitions and Potential
AML/CFT Risks* <http://goo.gl/G1PmdI> accessed 12 June 2015

FATF 2015 <http://www.fatf-gafi.org/pages/aboutus>

Financial Action Task Force 2015 *Who We Are* <http://www.fatf-gafi.org/pages/aboutus/> accessed 29 June 2015

FNB 2015 <https://goo.gl/JBNj2a>

First National Bank 2015 *eBucks Rewards Reaches R5 Billion Milestone in 15th Year*

<https://goo.gl/JBNj2a> accessed 7 June 2015

Gumtree Date Unknown <http://goo.gl/WyghaI>

Gumtree Date Unknown *Stand for Sale on Garden Route* <http://goo.gl/WyghaI>

accessed 10 June 2015

Ice³x 2015 <https://ice3x.com>

Ice³x 2015 *Home Page* <https://ice3x.com> accessed 29 June 2015

Ice³x 2015 <https://goo.gl/bqRbVI>

Ice³x 2015 *FAQ: How Do I Make a Deposit into My iceCUBED Account?*

<https://goo.gl/bqRbVI> accessed 8 June 2015

ISPA 2015 <http://ispa.org.za>

Internet Service Providers' Association 2015 *Home Page* <http://ispa.org.za>

accessed 29 June 2015

IOL 2009 <http://goo.gl/rLV4p0>

IOL Personal Finance 2009 *Loyalty Programme Can Pay Off for You*

<http://goo.gl/rLV4p0> accessed 10 June 2015

LocalBitcoins 2015 <https://localbitcoins.com>

LocalBitcoins 2015 *Home Page* <https://localbitcoins.com> accessed 29 June 2015

LocalBitcoins 2015 <https://goo.gl/mKOOvB>

LocalBitcoins 2015 *Buy Bitcoins Online with South African Rand*

<https://goo.gl/mKOOvB> accessed 8 June 2015

Louw 2014 <http://goo.gl/wUfK0W>

Louw G 2014 *The Johannesburg Bitcoin Company* <http://goo.gl/wUfK0W> accessed

16 June 2015

McKee 2013 <http://goo.gl/5nsFFz>

McKee J 2013 *Redefining Virtual Currency* <http://goo.gl/5nsFFz> accessed 28 June 2015

Morgan 2014 <http://goo.gl/kIP9I7>

Morgan J 2014 *A Simple Explanation of 'the Internet of Things'* <http://goo.gl/kIP9I7> accessed 29 June 2015

National Treasury 2014 <http://goo.gl/9il1Wa>

National Treasury 2014 *User Alert: Monitoring of Virtual Currencies* <http://goo.gl/9il1Wa> accessed 28 May 2015

Nedbank 2015 <https://nedbankgreenbacks.nedsecure.co.za>

Nedbank 2015 *Greenbacks* <https://nedbankgreenbacks.nedsecure.co.za> accessed 29 June 2015

OpenRigs 2015 <https://openrigs.com>

OpenRigs 2015 *Home Page* <https://openrigs.com> accessed 29 June 2015

Overstock 2015 <http://overstock.com>

Overstock 2015 *Home Page* <http://overstock.com> accessed 29 June 2015

Overstock 2015 <https://goo.gl/1L6p0c>

Overstock 2015 *Help Topics: Bitcoin for International Orders* <https://goo.gl/1L6p0c> accessed 29 June 2015

PayFast 2015 <https://payfast.co.za>

PayFast 2015 *Home Page* <https://payfast.co.za> accessed 29 June 2015

Prisco 2014 <https://goo.gl/Zbaxi6>

Prisco G 2014 *Andreas Antonopoulos Explains Bitcoin to the Canadian Senate* <https://goo.gl/Zbaxi6> accessed 29 June 2015

Prisco 2015 <https://goo.gl/xMeVDu>

Prisco G 2015 *Bankymoon Introduces Bitcoin Payments to Smart Meters for Power Grids* <https://goo.gl/xMeVDu> accessed 16 June 2015

Reddit Date Unknown <http://goo.gl/Yw3nSv>

Reddit Date Unknown *Property in South Africa for Sale in Bitcoin* <http://goo.gl/Yw3nSv> accessed 10 June 2015

SALS 2013 <http://goo.gl/YtG3ql>

South African Legislative Sector 2013 *Public Participation Framework for the South African Legislative Sector* <http://goo.gl/YtG3ql> accessed 12 June 2015

SARB 2009 <https://goo.gl/YZdmgI>

South African Reserve Bank 2009 *Position Paper on Electronic Money* <https://goo.gl/YZdmgI> accessed 12 June 2015

SARB 2014 <https://goo.gl/2nX9Tv>

South African Reserve Bank 2014 *Position Paper on Virtual Currencies* <https://goo.gl/2nX9Tv> accessed 27 May 2015

SARB 2015 <https://goo.gl/wqrBmD>

South African Reserve Bank 2015 *Position Papers* <https://goo.gl/wqrBmD> accessed 22 June 2015

Takelot 2015 <https://takealot.com>

Takelot 2015 *Home Page* <https://takealot.com> accessed 29 June 2015

TeleGeography 2015 <https://goo.gl/QP68Mn>

TeleGeography 2015 *Vodacom Attracts Only 72,000 M-Pesa Users in South Africa* <https://goo.gl/QP68Mn> accessed 8 June 2015

Twitter 2015 <https://twitter.com/zabitcoinatm>

Twitter 2015 *First African Bitcoin ATM* <https://twitter.com/zabitcoinatm> accessed 29 June 2015

Van Wyk 2013 <http://stellenboschbitcoin.splashthat.com/>

Van Wyk C 2013 *Stellenbosch Bitcoin* <http://stellenboschbitcoin.splashthat.com/> accessed 17 June 2015

Whotakescoin 2015 <http://goo.gl/LGtQoN>

Whotakescoin 2015 *South Africa* <http://goo.gl/LGtQoN> accessed 12 June 2015

Wikipedia 2015 <https://goo.gl/YrJjCf>

Wikipedia 2015 *Application Programming Interface* <https://goo.gl/YrJjCf> accessed 29 June 2015

Wikipedia 2015 <http://goo.gl/SaBw3l>

Wikipedia 2015 *M-Pesa: South Africa* <http://goo.gl/SaBw3l> accessed 8 June 2015

YouTube 2014 <https://goo.gl/erwSln>

YouTube 2014 *Andreas M Antonopoulos Educates Senate of Canada about Bitcoin* <https://goo.gl/erwSln> accessed 29 June 2015

ZapGo 2015 <https://www.zapgo.co>

ZapGo 2015 *Home Page* <https://www.zapgo.co> accessed 29 June 2015

LIST OF ABBREVIATIONS

API	Application programming interface
ASIC	Application-specific integrated circuit
Bit	Binary digit
CiTi	Cape Innovation and Technology Initiative
CPU	Central processing unit
DCVCs	Decentralised convertible virtual currencies

EFTs	Electronic fund transfers
FATF	Financial Action Task Force
FIC	Financial Intelligence Centre
FIC	Financial Intelligence Centre Act
FNB	First National Bank
FSB	Financial Services Board
GPU	Graphics processor unit
Harv J L & Tech	Harvard Journal of Law and Technology
Hastings Sci & Tech LJ	Hastings Science and Technology Law Journal
Hous J Int'l L	Houston Journal of International Law
ICT	Information and Communications Technology
IOT	Internet of Things
ISP	Internet Service Provider
ISPA	Internet Service Providers' Association
JEF	Journal of Economic and Financial Sciences
NPS	National Payment System
NPSA	National Payment Systems Act
Ohio St Entrepn Bus LL	The Ohio State Entrepreneurial Business Law Journal
SA Merc LJ	South African Mercantile Law Journal
SALS	South African Legislative Sector
SARB	South African Reserve Bank
SARS	South African Revenue Service
UN	United Nations
USB	Universal serial bus
VC	Virtual currencies
WoW gold	World of Warcraft Gold